

The Role of Actors in Determining Pattern of Communication Network of Eucalyptus Oil Processor Farmers (Case Study in Waisala District, West Seram Regency, Maluku Province)

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Abstract- Worldwide demand for the production of eucalyptus oil is very high. The problem is that eucalyptus oil processor farmers still find difficulty in accessing information and technology to improve quantity and quality of their production. Innovation diffusion is an important process which must be introduced in communication network of eucalyptus oil processor farmers because this process provides them with valuable information. The objective of this case study is to explain the role of relevant actors in determining the pattern of communication network where eucalyptus oil processor farmers do information exchange in their social system. Result shows that the pattern of communication network in this study is open or radial. Eucalyptus oil processor farmers do mostly making a relationship with La Nyong and La Icu because these two persons are considered by them as *opinion leader*, *bridge*, and *gatekeeper*, especially during information exchange process about eucalyptus oil. Both persons are giving more contribution than other colleague farmers. However, it signifies a fact that the communication of eucalyptus oil processor farmers is very low which at least information is not distributed evenly through communication network. The current study brings an implication that the communication network of eucalyptus oil processor farmers shall need the presence of actor with role of *opinion leader* who is skilled in developing a participative and dialogic communication with stakeholders through forms of education, training and extension to ensure that information will be distributed effectively at farmer level where farmers could receive benefits.

Keyword-: Role of Actors ; Communication Network Pattern ; Eucalyptus Oil Processor Farmers.

I. INTRODUCTION

A. Background

Indonesia is a seventh-rank country for exporting essential oil commodities to European continent (Indonesian Essential Oil Council). Essential oil is very important ingredient not only for health products, such as rubbing oil, but also for beauty products and pharmacy. Thus, essential oil products are highly demanded by international market.

Eucalyptus oil is a product derived from the processing of essential oil. Annual demand for eucalyptus oil is very high either in domestic or international markets. Eucalyptus oil production has achieved 500-600 tons/year, and this production has been managed by PERUM PERHUTANI in Java Island and been also operated by home industries at several regions in Maluku Province (Rimbawanto, 2014; Maulida, S. 2010).

The problem is that Indonesia still finds difficulty to satisfy the demand for eucalyptus oil production in domestic and international markets. The demand for eucalyptus oil production has reached around 1500 tons/year. This level is failed to be met even with domestic production stock. Therefore, even only for satisfying domestic demand, the government must import eucalyptus oil from China for about 1,000 tons per year (Toni, 2005). The gap between production demand and production stock is caused by a problem of productivity in farmer level.

Improving farmer-level productivity is a problematic because farmers do not have adequate access to information and do have a limited capacity to master more advance technology. As a consequence, it forces farmers to be helpless in eucalyptus oil production. This helplessness limits their capacity to produce interaction and communication, and this limit affects their behavior in managing eucalyptus oil production. According to Baharsyah (1994), "improving the quality of human resource in agriculture, main focus must be given on two matters. First, the quality of mastery of knowledge and technology must be improved. Second, the quality of skill obtained shall be improved, and also be supported with the fostering of enthusiasm, discipline and work professionalism. Quality improvement can be attained by increasing the effectiveness of education, training, and extension in agriculture, and by providing relevant information through which human resource can manage and utilize natural resource as good as possible.

B. Problem Formulation

Waisala District in West Seram Regency, Maluku Province, is a region with potential growth of eucalyptus plant, and the community (eucalyptus oil processor farmers) has long ago exploited this commodity for their livelihood. According to Hatta (2003), "eucalyptus plant grown in Maluku contains with sineol compound and oil rendement at higher level than similar plant in other regions of Indonesia". The problem is that eucalyptus oil processor farmers are still hard to access information and to master more ultimate technology, and thus, it is less surprising if they still process their commodities with traditional way.

The findings of previous studies in West Seram Regency have shown similar situations that represent the problem above. It can be described as: "lacking of information about processing technology which thus, farmers do processing with simple or conventional method; less information about how to use technology in productive way to obtain more promising quantity and quality of production; and the lack of education, training and extension about this matter" (Souhuwat, R., Ambarawati, I., Arga, I. 2013; Purimahua, 2013; Salaka, 2010; and Kartini, N. Irmayani., 2014).

Results of previous studies only explain the cause of why eucalyptus oil processor farmers' lack of information they need. In the other hand, there are fewer studies on related topics, such as: how the exchange and distribution of information happen at the level of eucalyptus oil processor farmers through their communication network, and who play important roles in this network. The low level on the availability and quality of information, and also on the mastery of processing technology among eucalyptus oil processor farmers will impact on their capacity to process eucalyptus oil.

Indeed, the availability of relevant information and the mastery of processing technology will surely improve farmers' productivity in processing eucalyptus oil. Farmers may support this productivity improvement effort by building a contact with many informants and then obtaining important information through interpersonal relationship. This relationship is analyzed with the approach of communication network to identify the flow of message and the quality of information exchanged by eucalyptus oil processor farmers in their communication network. Roger and Kincaid (1981) said that "one aspect considered to analyze communication network is the identification of specific roles played by certain individual in the network". These specific roles include *opinion leader*, *bridge*,

gatekeeper, *liason* and *isolate*. The more important is the role played by the actors (eucalyptus oil processor farmers) in their communication network, the more clarified is the pattern of this communication network.

Based on problems formulated, current study is then aimed to explain the role of relevant actors in the communication network among eucalyptus oil processor farmers in Waisala District, West Seram Regency.

II. METHOD OF RESEARCH

A. Paradigm of Research

The paradigm used in this study is *positivism*, and therefore, this study uses quantitative approach. As notified by Sugiyono (2015), “quantitative approach is a method that emphasizes on *positivism* paradigm, and it is often used to examine certain population or sample with numerical instrument”. Similar note is given by Creswell, J. W. (2010), stating that “quantitative approach is used to attest certain theories by examining relationship of variables and measuring this relationship with numerical instrument, and then analyzing the result with statistic procedures”.

B. Location and Time of Study

This study takes a place in Waisala District, West Seram Regency, and this region is chosen by considering few conditions, such as: (1) this region is one of eucalyptus oil central producers in Maluku Province other than Buru Island; (2) eucalyptus plant grown in this region contains with sineol (oil substance in eucalyptus leaf) which can dissolve in the oil at range of 50-60 ppm (*part per milion*); and (3) farmers still use traditional method of processing.

The author put the conditions above into consideration, and attempts to conduct a study on the region, at least to understand how is the role of actors in communication network of eucalyptus oil processor farmers and how is the pattern of communication network established after farmers exchange the information. The study starts from October to December 2016 in Waisala District, West Seram Regency, Maluku Province.

C. Respondent Determination Method

One important stage in this study is determining population and sample. The sample in this study has different characteristic from sample in other usual quantitative study. Other studies may feel adequate by only using survey, content analysis, or other quantitative instrument. The current study is examining not only the actors in the communication network, but also the situation

of this communication network and the relationship of the actors in this network. Therefore, the characteristic of sampling method in this study is definitely different from other quantitative study (Eriyanto, 2014).

In this study, sampling starts from population. The size of population, therefore, must be determined properly because population is always the base of sampling. Borgatti and Halgin (2011) declared that “in the study of network (in this study, it refers to communication network), there is no natural boundary, and it makes this study different from other quantitative study. In network study, the object of study is not respondents, but the network. It must be noted that the member of network may not be the member of population of study.”

Laumann (1983) indicated that “the determination of population utilizes two approaches involving *specification of boundaries* in network, and these two are realist and nominalist approaches”. Realist approach is used to set the boundary of network population. Thus, communication network must be understood on the perspective of informants or actors, and the author cannot use subjective assumption to determine this network. The author shall allow the actors to determine and define the network where they shall belong to, and the author only describes the network they determine.

Nominalist approach is also used to determine the boundary of network population but it is done by understanding the definition of network based on the author’s concept. In other words, the author defines the network and boundaries in pursuance of goals, framework, and theories that the author uses in research.

Concerning with explanation above, the current study uses nominalist approach. The analysis of communication network, therefore, will be focused on interpersonal relationship in the communication network of eucalyptus oil processor farmers in Waisala District, West Seram Regency, Maluku Province. This focus is considered as relevant to the objective and the conceptual frame of the study. The sample is subtracted through a census from population of eucalyptus oil processor farmers in Waisala District, and the resulted sample includes 124 farmers (Department of Forestry, Maluku Province, 2014).

D. Type and Source of Data

Data type is quantitative data sorted from primary and secondary data. Scot (2000) explained that “primary data in the study of network are those about actors and also about

relationship among them". The actors in this study refer to farmers who have activities concerned with eucalyptus oil. Secondary data are collected from organizations that support the study.

E. Data Collection Technique

Data of this study are collected with interview. The instrument of interview contains with questions about relevant actors (eucalyptus oil processor farmers) and their relationship in communication network. The questions are then divided into three sections (Borgatti in Eriyanto, 2014). *First* section of question is about *generator name*. The question will identify names of individuals who have relation with actors (eucalyptus oil processor farmers). The ultimate goal of the question is to construct the list of names of individuals in actors' contact network. Thus, informants or respondents are required to mention names of their friends or other network members. The answer to the question will provide the author with the names of actors and their network.

Second section is *interpreter name*. The question concerns with form, type, and nature of relationship across actors and of their network. It can be said that when the author have obtained names of network members (*generator name*), informants will be given with question about form, type and intensity of relationship across actors in network. The objective of question in second section is to collect data or information about form and intensity of relationship across actors in network.

Third section is *interrelaters name*. Question in this section is asked to understand the relationship of each actor and also the network. The obtained names (*generator name*), and also the form, type and intensity of relationship (*interpreter name*) are explored further to see the characteristic of relationship across the actors.

F. Data Analysis

The analysis of communication network is done by processing the data of the role of actors and also the pattern of communication network. The value of *density* is used to determine whether a network has a pattern of open or closed.

The following steps must be taken in the analysis of communication network:

1. Creating an *edge list* in matrix format to arrange names of actors and their relationship. Then, sociogram is made

to depict information flow across the actors (eucalyptus oil processor farmers).

2. Identifying the actors based on their role in communication network. The following is the type of role:
 - a. *Opinion Leader* is actor whose opinion is always followed by other actors in communication network.
 - b. *Bridge* is actor who can successfully connect or bridge the opinions of other actors in communication network.
 - c. *Gatekeeper* is actor who is functioned as the controller of information flow across actors in communication network.
 - d. *Liason* is actor who actually does not belong to the group of the actors, but still can provide information to the actors in communication network.
 - e. *Isolate* is actor with limited contact in communication network.
3. Measuring communication network based on *density value* to determine whether the pattern of communication network is open or closed. The operation of this measurement is facilitated by computer software of UCINET Version VI developed by Borgatti and Evert. This software is used because it helps the author to produce an estimation of optimum value after three replications of counting (Eriyanto, 2014).

III.RESULT AND DISCUSSION

A. Sociogram Depicting The Communication Network and The Role of Eucalyptus Oil Processor Farmers

Sociogram is a communication map depicting interpersonal relationship of eucalyptus oil processor farmers during the exchange of information about eucalyptus oil. This map also represents a structure that supports communication network of eucalyptus oil processor farmers.

This communication network structure provides a description about the role of actors (eucalyptus oil processor farmers) in communication network and the pattern of this communication network. Figure 1 (shown in the next page) indicates interpersonal relationship of eucalyptus oil processor farmers during the exchange of information about eucalyptus oil in Waisala District, West Seram Regency, Maluku Province.

The analysis on communication network depicted in sociogram has given a result. It is said that interpersonal relationship of eucalyptus oil processor farmers has

proceeded in two forms. First is the relationship across eucalyptus oil processor farmers in their communication network, while second is the relationship between eucalyptus oil processor farmers and other actor outside the network.

As indicated by sociogram, farmer with the highest number of relationship in communication network, in comparison with other farmers, is Actor Number 14 (Abu Habar), 46 (La Icu), 52 (La Junaedi), 102 (La Nyong) and 116 (Usman Usemahu).

Abu Habar has a contact or relationship with a total of 20 actors, including his colleague farmers and actors outside the network. This contact involves: Actor Number 11 (La

Taha), 12 (Masdin), 13 (La Aji), 15 (La Mandae), 16 (La Safu), 17 (Rahim), 20 (La Jamli), 21 (La Ambo), 22 (Usman Tajir), 25 (La Ode Roa), 46 (La Icu), 52 (La Junaedi), 59 (Rohib), 102 (La Nyong), 116 (Saman Usemahu), A (Extension Officer), D (Chief of Waisala Village) and E (Department of Industry and Trade for West Seram Regency).

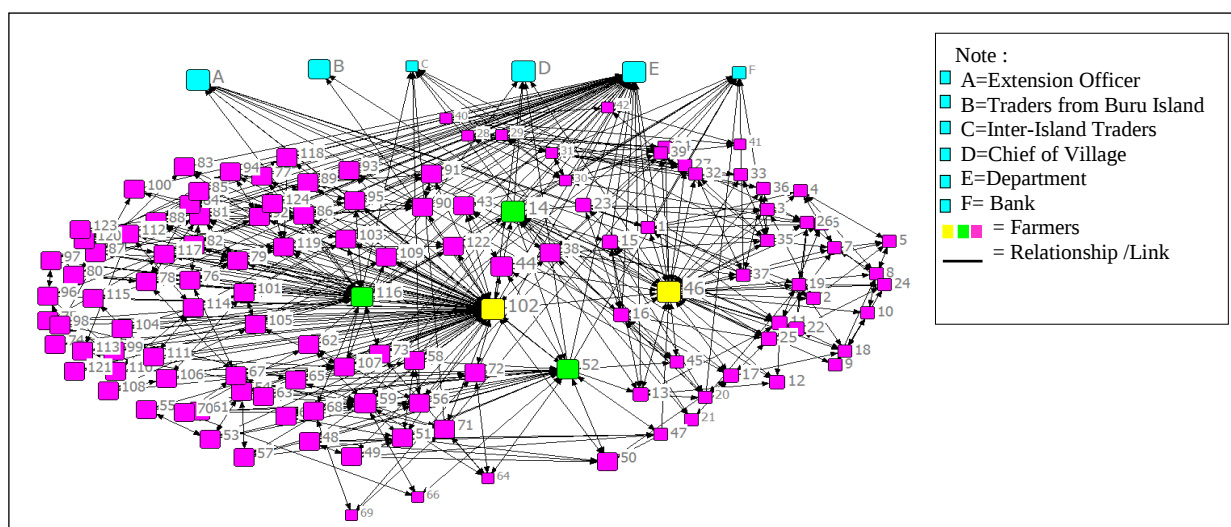


Figure 1. The Sociogram Depicting Communication Network of Eucalyptus Oil Processor Farmers in Waisala District, West Seram Regency, Maluku Province.

Source: Primary Data, 2016

La Junaedi makes a relationship with 26 individuals and they include: Actor Number 44 (Baharudin), 45 (Djafar), 47 (Ali), 48 (Tosatu), 49 (La Ani), 50 (La Roi), 51 (Mansur), 53 (Anwar), 54 (Asral), 55 (La Jumari), 56 (La Abujafar), 57 (Kohlil), 58 (La Samiri), 59 (Rohib), 60 (Wa Sutinah), 63 (Chandra), 64 (Saiful), 65 (Yasin), 67 (Rosman), 102 (La Icu), A (Extension Officer), D (Chief of Waisala Village), E (Department of Industry and Trade for West Seram Regency) and F (bank representative).

Usman Usemahu has a contact involving 30 individuals including Actor Number 14 (Abu Habar), 68 (La Hasni), 73 (La Idi), 74 (Abuhaer Usemahu), 75 (Sulaeman Lessy), 76 (Umar Pelulessy), 77 (Muhamad Pelulessy), 79 (Masrin Latukaisupi), 80 (Karim Samal), 81 (Arep), 82 (Muhidin

Samal), 83 (Ding badin), 84 (Ego Badia), 86 (Gafur Palue), 87 (Sadangila), 88 (Jaban Palisoa), 95 (Mahmud Usemahu), 97 (Samad Samal), 99 (La hadi), 102 (La Nyong), 103 (Rasmin Tomagola), 113 (Lukman Husein), 117 (Nadu Samal), 119 (Mahmud Palirone), 121 (Arman), 122 (Ode Sahu), 123 (Rahman Lina), 124 (Haropen Samal), A (Extension Officer), D (Chief of Waisala Village) and E (Department of Industry and Trade for West Seram Regency).

Based on the sociogram, Abu Habar, La Junaedi, and Usman Usemahu play the role as *opinion leader* in the communication network. They have a great experience and once have attended trainings about eucalyptus oil production. Most of the remaining farmers rely on these

three prominent figures to obtain information about technique for better production of eucalyptus oil.

Farmer Number 46 (La Icu) and Farmer Number 102 (La Nyong) are also important figures. La Icu has a contact of 39 individuals, while La Nyong has a relationship with 82 individuals. La Icu's contact includes Actor Number 1 (Jamin), 2 (Zamlan), 3 (Ali), 4 (Umar Husein), 5 (Ali Mudin), 6 (Aco Samal), 7 (Abdul Gani), 8 (La Emang), 9 (La Beso), 10 (La Hawa), 11 (La Taha), 12 (Masdin), 13 (La Aji), 14 (Abu Habar), 15 (La Mandae), 16 (La Safu), 17 (Rahim), 18 (La Ucu), 19 (Sukardi), 22 (Usman Tajir), 23 (Wa Yati), 24 (La Uda), 25 (La Ode Roa), 27 (La Sale), 32 (Malumat), 33 (La Haeri), 34 (La Bunga), 35 (La Isa), 36 (La Pane), 37 (La Ali Ninihow), 39 (La Hasan), 44 (Baharudin), 102 (La Nyong), A (Extension Officer), B (Traders from Buru Island), D (Chief of Waisala Village) and E (Department of Industry and Trade for West Seram Regency).

Moreover, La Nyong's contact involves Actor Number 14 (Abu Habar), 38 (La Madi Luka), 43 (Laita Tomia), 44 (Baharudin), 46 (La Icu), 48 (Tosatu), 49 (La Ani), 50 (La Roi), 51 (Mansur), 52 (La Junaidi), 53 (Anwar), 54 (Asral), 55 (La Jumari), 56 (La Abujafar), 57 (Kohlil), 58 (La Samiri), 59 (Rohib), 60 (Wa Sutinah), 61 (Sarif), 62 (Rasif Umar), 63 (Chandra), 65 (Yasin), 67 (Usman Galil), 68 (La Hasni), 70 (Sukur), 71 (Umar naim), 72 (La Hane), 73 (La Idi), 74 (Abuhaer Usemahu), 75 (Sulaeman Lessy), 76 (Umar Pelupessy), 77 (Muhamad Pelupessy), 78 (Ahmad), 79 (Masrin Latukaisupi), 80 (Karim Samal), 81 (Arep), 82 (Muhidin Samal), 83 (Ding Badin), 84 (Badia), 85 (Muridun Ulate), 86 (Gafur Palue), 87 (Sadangila), 88 (Jaban Palisoa), 89 (Yani Usemahu), 90 (Tahir Toding), 91 (Abuhair Samal), 92 (Jidung Milla), 93 (Sudin Samal), 94 (Mahmud Samal), 95 (Mahmud Usemahu), 96 (Saman Tomagola), 97 (Samad Samal), 98 (Mahmud Nurlete), 99 (La Hadi), 100 (La Hasan), 101 (Jasmin Tomagola), 103 (Rasmin Tomagola), 104 (Ijrun), 105 (La Cica), 106 (Hamza Tomia), 107 (La Noi), 108 (Nazlin), 109 (La Andi), 110 (Udin), 111 (Rahmadi), 112 (Rahmat), 113 (Lukman Husein), 114 (Ramli), 115 (Hamza Samal), 116 (Saman Usemahu), 117 (Nadu Samal), 118 (Husein Sandapan), 119 (Mahmud Palirone), 120 (Muslan Samal), 121 (Arman), 122 (Ode Sahu), 123 (Rahman Lina), 124 (Haropen Samal), A (Extension Officer), B (Collector Traders from Buru Island), D (Chief of Waisala Village), and E (Department of Industry and Trade for West Seram Regency).

Both La Icu and La Nyong play three roles in communication network, namely being as *opinion leader*,

bridge, and *gatekeeper*. Those predicates are given to them due to some reasons. They have experiences and also have attended trainings on eucalyptus oil production, and therefore, their opinion is always to be heard (as *opinion leader*). They receive several visits from other farmers who need loan for their production, and act as the intermediary between farmers and Actor B (Traders from Buru Island) (as *bridge*), especially when farmers decide to sell their eucalyptus oil to another island. The term of *gatekeeper* is entitled to La Icu and La Nyong because they help to control over the entry of information from outside the network, and also over the membership of the network. These three roles successfully keep most farmers in communication network to have relationship with both La Icu and La Nyong.

Liason is actor outside the network of farmers but providing important information to farmers in communication network. Some actors play the role of liason by giving information about techniques of eucalyptus oil production. These actors are: A (Extension Officer), B (Traders from Buru Island), D (Chief of Waisala Village), E (Department of Industry and Trade for West Seram Regency), and F (the bank). Information about work capital and output marketing are obtained by farmers from Actor B through the assistance of La Icu and La Nyong who act as intermediary. Actor F (the bank) also gives the farmers the information about loan capital, but it is done indirectly using the service of Actor Number 14 (Abu Habar), 52 (La Junaedi), and 116 (Saman Usemahu).

Farmer with *isolate* role includes Actor Number 124 (Haropen Samal), 121 (Arman), 74 (Abuhaer Usemahu), and 63 (Chandra). Their relationship with other farmers in network is counted only once or twice. These actors have side jobs and thus, they do not have adequate time to interact with other farmers, or possibly are less willing to talk or ask information about eucalyptus oil.

B. Communication Network Pattern of Eucalyptus Oil Processor Farmers

Whether the communication network pattern of eucalyptus oil processor farmers is closed (*closure network*) or open (*open network*) can be determined based on *density value* ranging from 1 to 100 percents. If the density value comes near to 100 percents, then network pattern is closed (*closure network*). In contrast, when density value is less than 50 percents, network pattern is open (*open network*).

The finding in the field shows that density value of communication network system covering eucalyptus oil processor farmers is 9.10 percents. It can be said that density

value is less than 50 percents, and therefore the pattern of communication network is open (*open network*). According to Coleman in Eriyanto (2014), "most members of the network do not link directly to each other, or in other words, the network always has a loose density which then produces a pattern of *open network*, which is expressed by Rogers and Kincaid (1981) as similar to a pattern of *radial network*".

The expression of *open* or *radial* emerges because most farmers prefer to have relationship with actors who have central roles in communication network. As a result, farmers have relationship less with other farmers, or just never have at all. It seems that farmers use the service of central actors (Abu Habar, La Icu, La Junaedi, La Nyong and Usman Usemahu) to develop relationship with other farmers because almost all farmers in network have great dependency on these actors. Three actors respectively Abu Habar, La Junaedi and Usman Usemahu are considered as resource person because farmers can obtain from them the information about techniques of eucalyptus oil production. La Icu and La Nyong are actors who are contacted by farmers who need for information about production techniques, loan capital, and output marketing.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Based on the result previously explained, it is concluded that eucalyptus oil processor farmer who plays role as *opinion leader* includes: Actor 14 (Abu Habar), 46 (La Icu), 52 (La Junaedi), 102 (La Nyong), and 116 (Usman Usemahu). These five actors help farmers to obtain information about eucalyptus oil production techniques. For information about loan capital and output production, farmers are usually contacting Actor Number 46 (La Icu) and 102 (La Nyong). These two actors play three roles, respectively as *opinion leader*, *bridge* between farmers and traders from Buru Island, and *gatekeeper* who control over information flow at farmer level. Actor with *liason* role includes A (Extension Officer), B (Traders from Buru Island), D (Chief of Waisala Village), E (Department of Industry and Trade for West Seram Regency), and F (the bank). Role of *isolate* has been played by Actor Number 124 (Haropen Samal), 121 (Arman), 74 (Abuhaer Usemahu), and 63 (Chandra). They are farmers with the lowest level of relationship in communication network, and only makes relationship in once or twice.

The pattern of communication network across eucalyptus oil processor farmers is called as *open network* or *radial network*. The reason behind this pattern is that

most farmers are likely to have relationship more with actors with central roles in communication network, and thus, have relationship less with other farmers, or never have this relationship at all.

B. Suggestion

Suggestions are given as follows:

1. The dissemination of information shall be effective if actors with *opinion leader*, *bridge*, and *gatekeeper* roles are organized and trained to facilitate information exchange in communication network of eucalyptus oil processor farmers. The information can be given to farmers through education, training and extension.
2. The government must intensively do coordination and communication, and also perform a supportive action to develop the production of eucalyptus oil in the region of study. This action can be manifested through education, training and extension.

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